WHAT IS CLAIMED IS:

1. An antifibrillogenic agent for inhibiting amyloidosis and/or for cytoprotection, which comprises a peptide of Formula I, an isomer thereof, a retro or a retro-inverso isomer thereof or a peptidomimetic thereof:

Xaa_1-Xaa_2-Xaa_3-Xaa_4 I

wherein,

Xaa_1 selected from the group consisting of Lys, Xaa_5-Lys-;

Xaa_5 is selected from the group consisting of Lys, His-Gln-, His-His-Gln-, Val-His-His-Gln-, Glu-Val-His-His-Gln-, Asp-Asp-Asp-, Gln-;

Xaa_2 is any amino acid;

Xaa_3 is Val;

Xaa_4 is selected from the group consisting of Phe, Phe-NH_2, Phe-Phe, Phe-Phe-Ala, Phe-Phe-Ala-NH_2, Phe-Phe-Ala-Gln, Phe-Phe-Ala-Gln-NH_2;

wherein said peptide has at least one [D] amino acid residue,

with the proviso that Lys-Lys-Leu-Val-Phe-Phe-Ala is an all-[D] peptide.

2. The antifibrillogenic agent of claim 1, wherein Xaa_2 is a hydrophobic amino acid residue.

3. The antifibrillogenic agent of claim 1, wherein the peptide of formula I has at least two [D] amino acid residues.

4. The antifibrillogenic agent of claim 1, wherein the peptide of formula I has at least three [D] amino acid residues.

5. The antifibrillogenic agent of claim 1, wherein the peptide of formula I has one [L] amino acid residue.

6. The antifibrillogenic agent of claim 1, wherein the peptide of formula I is an all-[D] isomer peptide.

7. The antifibrillogenic agent of claim 1, 2, 3, 4, 5, or 6, wherein said peptide of Formula I is selected from the group consisting of:

Lys-Ile-Val-Phe-Phe-Ala (SEQ ID NO:1);
Lys-Lys-Leu-Val-Phe-Phe-Ala (SEQ ID NO:2);
Lys-Leu-Val-Phe-Phe-Ala (SEQ ID NO:3);
Lys-Phe-Val-Phe-Phe-Ala (SEQ ID NO:4);
Ala-Phe-Phe-Val-Leu-Lys (SEQ ID NO:5);
Lys-Leu-Val-Phe (SEQ ID NO:6);
Lys-Ala-Val-Phe-Phe-Ala (SEQ ID NO:7);
Lys-Leu-Val-Phe-Phe (SEQ ID NO:8);
Lys-Val-Val-Phe-Phe-Ala (SEQ ID NO:9);
Lys-Ile-Val-Phe-Phe-Ala-NH_2 (SEQ ID NO:10);
Lys-Leu-Val-Phe-Phe-Ala-NH_2 (SEQ ID NO:11);
Lys-Phe-Val-Phe-Phe-Ala-NH_2 (SEQ ID NO:12);
Ala-Phe-Phe-Val-Leu-Lys-NH_2 (SEQ ID NO:13);
Lys-Leu-Val-Phe-NH_2 (SEQ ID NO:14);
Lys-Ala-Val-Phe-Phe-Ala-NH_2 (SEQ ID NO:15);
Lys-Leu-Val-Phe-Phe-NH_2 (SEQ ID NO:16);
Lys-Val-Val-Phe-Phe-Ala-NH_2 (SEQ ID NO:17);
Lys-Leu-Val-Phe-Phe-Ala-Gln (SEQ ID NO:18);
Lys-Leu-Val-Phe-Phe-Ala-Gln-NH_2 (SEQ ID NO:19);
His-His-Gln-Lys-Leu-Val-Phe-Phe-Ala-NH_2 (SEQ ID NO:20);
His-His-Gln-Lys (SEQ ID NO:23);
and
Gln-Lys-Leu-Val-Phe-Phe-NH_2 (SEQ ID NO:24).

8. The antifibrillogenic agent of claim 1, wherein the peptide of formula I is a peptide as set forth in SEQ ID NO:2 or SEQ ID NO:3.

9. A labeled conjugate for *in vivo* imaging of amyloid deposits, which comprises a conjugate of formula II:

$$A\text{-}B\text{-}C \qquad \text{II}$$

wherein A is an amyloid plaque-targeting moiety selected from the group consisting of a peptide of Formula I as defined in claim 1, an isomer thereof, a retro or a retro-inverso isomer thereof and a peptidomimetic thereof,
wherein B is a linker portion allowing attachment of the amyloid plaque-targeting moiety to C; and
wherein C is a label that allows for said *in vivo* imaging.

10. The labeled conjugate of claim 9, wherein Xaa_2 in Formula I is a hydrophobic amino acid residue.

11. The labeled conjugate of claim 9, wherein the peptide of formula I has at least two [D] amino acid residues.

12. The labeled conjugate of claim 9, wherein the peptide of formula I has at least three [D] amino acid residues.

13. The labeled conjugate of claim 9, wherein the peptide of formula I has one [L] amino acid residue.

14. The labeled conjugate of claim 9, wherein the peptide of formula I is an all-[D] isomer peptide.

15. The labeled conjugate of claim 9, 10, 11, 12, 13 or 14, wherein said peptide of Formula I is selected from the group consisting of:

Lys-Ile-Val-Phe-Phe-Ala (SEQ ID NO:1);
Lys-Lys-Leu-Val-Phe-Phe-Ala (SEQ ID NO:2);
Lys-Leu-Val-Phe-Phe-Ala (SEQ ID NO:3);
Lys-Phe-Val-Phe-Phe-Ala (SEQ ID NO:4);
Ala-Phe-Phe-Val-Leu-Lys (SEQ ID NO:5);
Lys-Leu-Val-Phe (SEQ ID NO:6);
Lys-Ala-Val-Phe-Phe-Ala (SEQ ID NO:7);
Lys-Leu-Val-Phe-Phe (SEQ ID NO:8);
Lys-Val-Val-Phe-Phe-Ala (SEQ ID NO:9);
Lys-Ile-Val-Phe-Phe-Ala-NH_2 (SEQ ID NO:10);
Lys-Leu-Val-Phe-Phe-Ala-NH_2 (SEQ ID NO:11);
Lys-Phe-Val-Phe-Phe-Ala-NH_2 (SEQ ID NO:12);
Ala-Phe-Phe-Val-Leu-Lys-NH_2 (SEQ ID NO:13);
Lys-Leu-Val-Phe-NH_2 (SEQ ID NO:14);
Lys-Ala-Val-Phe-Phe-Ala-NH_2 (SEQ ID NO:15);
Lys-Leu-Val-Phe-Phe-NH_2 (SEQ ID NO:16);
Lys-Val-Val-Phe-Phe-Ala-NH_2 (SEQ ID NO:17);
Lys-Leu-Val-Phe-Phe-Ala-Gln (SEQ ID NO:18);
Lys-Leu-Val-Phe-Phe-Ala-Gln-NH_2 (SEQ ID NO:19);
His-His-Gln-Lys-Leu-Val-Phe-Phe-Ala-NH_2 (SEQ ID NO:20);
His-His-Gln-Lys (SEQ ID NO:23);
and
Gln-Lys-Leu-Val-Phe-Phe-NH2 (SEQ ID NO:24).

16. The labeled conjugate of claim 15, wherein B is selected from the group consisting of Glucose and Phe.

17. The labeled conjugate of claim 15, wherein C is ^{99m}Tc.

18. A method for the treatment of amyloidosis disorders in a patient, which comprises administering

to said patient a therapeutically effective amount of a peptide of Formula I as defined in claim 1, 2, 3, 4, 5, 6, 7 or 8.

19. A method for the treatment of amyloidosis disorders in a patient, which comprises administering to said patient a therapeutically effective amount of an antifibrillogenic agent as defined in claim 1, 2, 3, 4, 5, 6, 7 or 8.

20. A composition for the treatment of amyloidosis disorders in a patient, which comprises a therapeutically effective amount of a peptide of Formula I as defined in claim 1, 2, 3, 4, 5, 6, 7 or 8 in association with a pharmaceutically acceptable carrier.

21. A composition for the treatment of amyloidosis disorders in a patient, which comprises a therapeutically effective amount of an antifibrillogenic agent as defined in claim 1, 2, 3, 4, 5, 6, 7 or 8 in association with a pharmaceutically acceptable carrier.

22. A composition for *in vivo* imaging of amyloid deposits, which comprises a therapeutically effective amount of a labeled conjugate as defined in claim 9, 10, 11, 12, 13, 14, 15, 16 or 17 in association with a pharmaceutically acceptable carrier.

23. Use of a peptide of Formula I as defined in claim 1, 2, 3, 4, 5, 6, 7 or 8 for inhibiting amyloidosis and/or for cytoprotection.

24. Use of an antifibrillogenic agent as defined in claim 1, 2, 3, 4, 5, 6, 7 or 8 for inhibiting amyloidosis and/or for cytoprotection.

25. Use of a labeled conjugate as defined in claim 10, 11, 12, 13, 14, 15, 16 or 17 for *in vivo* imaging of amyloid deposits.

26. Use of a peptide of Formula I as defined in claim 1, 2, 3, 4, 5, 6, 7 or 8 for the manufacture of a medicament for inhibiting amyloidosis and/or for cytoprotection.

27. Use of an antifibrillogenic agent as defined in claim 1, 2, 3, 4, 5, 6, 7 or 8 for the manufacture of a medicament for inhibiting amyloidosis and/or for cytoprotection.

28. Use of a labeled conjugate as defined in claim 10, 11, 12, 13, 14, 15, 16 or 17 for the manufacture of a medicament for *in vivo* imaging of amyloid deposits.

29. A peptide, an isomer thereof, a retro or a retro-inverso isomer thereof or a peptidomimetic thereof, for use in inhibiting amyloidosis and/or for cytoprotection, said peptide having a sequence taken from the β-sheet region of an amyloid protein selected from the group consisting of IAPP and protease resistant prion protein.

30. Use of a peptide as defined in claim 29 for inhibiting amyloidosis and/or for cytoprotection.

31. Use of a peptide as defined in claim 29 for the manufacture of a medicament for inhibiting amyloidosis and/or for cytoprotection.

32. A composition for inhibiting amyloidosis and/or for cytoprotection, which comprises a therapeutically effective amount of a peptide as defined in claim 31, 30 or 31 in association with a pharmaceutically acceptable carrier.

33. Use of a labeled peptide as defined in claim 29 for the manufacture of a medicament for *in vivo* imaging of amyloid deposits.

34. A process for the preparation of cells suitable for transplantation into a mammal, which cells are capable of forming amyloid deposits, said process comprising contacting the cells *in vitro* with the peptide of Formula I as defined in claim 1 or with the antifibrillogenic compound as defined in claim 1, 2, 3, 4, 5, 6, 7 or 8 for inhibiting amyloid deposit formation.

35. Process according to claim 34, wherein said peptide of Formula I or said antifibrillogenic compound causes breakdown of amyloid deposits, the deposits having been formed by said cells prior to said contact.

36. Process according to claim 34 or 35, in which the cells are cultured in the presence of the peptide of Formula I or the antifibrillogenic compound.